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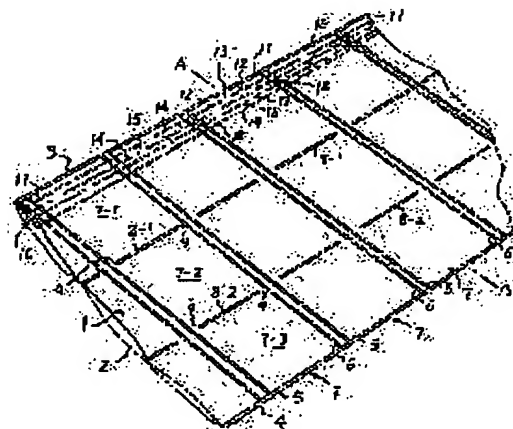
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(54) EXPANDABLE AND FOLDABLE AIR BAG

(57)Abstract:

PURPOSE: To enable an expanding part to be unforcedly freely folded at a folding seal after it is expanded by blowing air to make an air bag expandable and foldable.

CONSTITUTION: A self-sealing air blow tube 10 is inserted through between two films 1, 2 having a predetermined width and a predetermined length in the length direction of the film. The films are sealed at both side edges 3, 4 thereof. The both films are sealed in the width direction thereof at a plurality of crosswise partitioning lines 5, 6 crossing the films in the width direction thereof to be partitioned into a plurality of expanding parts 7 isolated from each other and continuously arranged. One or more folding seals 8-1, 8-2... are formed across each of the expanding parts 7 between the partitioning lines 5, 6 on the both sides thereof to divide the expanding part 7 into two or more partitioned expanding parts 7-1, 7-2, 7-3....



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CLAIMS

[Claim(s)]

[Claim 1] Among the airtight films 1 and 2 of two sheets of predetermined width of face, make the insertion penetration of the self-** type air entrainment tube carry out in the film die-length direction, and the edges on both sides of a film are used as the sealing side edges 3 and 4. In the air bag which furthermore crossed the width of face of a film, sealed both films crosswise in two or more crossing jump-off lines 5 and 6, and formed each expansion section 7 in succession in large numbers The seal line 8 for bending which lies among the crossing jump-off lines 5 and 6 of both the side in each expansion section 7 It is 8-2 8-1 or more than it one so that circulation of the air to the whole expansion section 7 may be permitted. — Form and each expansion section 7 is divided into two pieces or the partition expansion section 7-1 beyond it, and 7-2 —. The air bag which is characterized by making bending of each partition expansion section possible bordering on the bending seal after expansion and in which expansion bending is possible.

[Claim 2] The air bag which has left the airstream path 9 among the both ends and crossing jump-off lines 5 and 6 by one line by which said seal for bending continued, respectively and in which expansion bending according to claim 1 is possible.

[Claim 3] The air bag which said seal for bending is formed in the shape of an intermittence broken line, respectively, and permits the air circulation between the partition expansion sections and in which expansion bending according to claim 1 is possible.

[Claim 4] An air bag with two [possible / said seal for bending / in each expansion section 7] of 8-1 and expansion bending according to claim 2 or 3 from which it is formed eight to two times, and each expansion section is divided into the three partition expansion sections 7-1 in which 3 chip boxes are possible, 7-2, and 7-3.

[Claim 5] The air bag which is divided into four pieces by which three of said seal for bending are formed in each expansion section 7 8-1, 8-2, 8-3, or more than it, and each expansion section is bent more than a quarto or it or the partition expansion section 7-1 beyond it, 7-2, 7-3, and 7-4 — and in which expansion bending according to claim 2 or 3 is possible.

[Claim 6] The air bag all whose each of said partition expansion section is ** length and in which expansion bending according to claim 1 is possible.

[Claim 7] The air bag which is the die length from which each of said partition expansion section differs and in which expansion bending according to claim 1 is possible.

[Claim 8] The penetration entrainment way 11 where said air entrainment tube penetrates each expansion section 7 altogether, and the air bag it is [air bag] the type which has the partition paths 20, 21, and 22 per piece [at least], and the self-** type openings 13, 15, 17, and 19 in each expansion section to which it installed in this side by side and in which expansion bending according to claim 1 is possible.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] It relates to the air bag which can bend each expansion section easily, can classify it and can be used as shock absorbing material, packing, etc. and in which expansion bending is possible while it will swell about that it can expand and a bendable air bag as the expansion section with which plurality was divided, if air is blown, although this invention is specifically flat at the beginning.

[0002]

[Description of the Prior Art] Although shock absorbing material, such as styrene foam, is generally put in a clearance in case goods, such as a videocassette recorder and a television set, are put into containers, such as corrugated paper Since there was a difficulty which does not suit the magnitude of a clearance with a sufficient condition, or damages surface finish of goods, these people in order to improve this The former, Many air bags which inserted in the self-** type entrainment tube and which can be expanded were developed, and it has applied (for example, air bag indicated to Japanese Patent Application No. 2-410577). The buffering by such air bag is shown in the right-hand side of drawing 6 , and when the goods which should be buffered are videocassette recorders V, reliance is divided into a right end by three air bags b in the drawing 6 . The self-** type entrainment tube a is inserted in each air bag b, respectively, and it is inserted in the clearance between goods and a container (not shown) in the flat condition, and subsequently an air bag b blows air and is expanded. Since unlike the shock absorbing material which has the solid-state volume from the beginnings, such as the conventional styrene foam, this follows in footsteps of magnitude of a clearance freely, fills a clearance and makes the business of a buffer, it is convenient. However, it connected two or more air bags on Tape c depending on the case, and had the inconvenience of requiring the additional activity of making it not become scattering etc. while it required trouble, since the old air bag had to prepare three pieces thru/or the air bag beyond it like illustration and had to blow air into each air bag separately, in order to buffer so that the husk of the goods edge may be carried out, since an expansion part is not bendable reasonable. Moreover, since the air bag of a specific dimension had to be prepared corresponding to it when thickness T of goods changed, diversifying a production facility etc. had disadvantage also in respect of production.

[0003]

[Problem(s) to be Solved by the Invention] therefore — since this invention expands — **** — it makes as a technical problem offering that expansion is possible and the bendable air bag for a buffer which it can bend to arbitration reasonable, and an air entrainment can be managed at once through each part which should be bent, and can respond also to change of the dimension of packaging goods-ed, or a configuration easily.

[0004]

[Means for Solving the Problem] For this reason, this invention makes the insertion penetration of the self-** type air entrainment tube carry out in the film die-length direction between the airtight films of two sheets of predetermined width of face, and seals film edges on both sides. In the air bag which furthermore crosses the width of face of a film, seals both films crosswise in

two or more jump-off lines, forms much each expansion sections successively, and changes By forming the seal line for bending which lies between the jump-off line in each expansion section 1 or more than it in the mode which permits the air circulation to the whole expansion section It enables it to bend each expansion section freely between each partition expansion section as two pieces or the partition expansion section beyond it.

[0005] By leaving the path where air circulates between the edge of the seal for bending, and a crossing jump-off line, as the seal for bending does not cross a crossing jump-off line While being able to expand two or more partition expansion sections completely by 1 time of the air entrainment Since it becomes movable [air] between each partition expansion section also after expansion, the swelling condition of each part can be equated and the strong local external pressure to one of the partition expansion sections can be made to ease with a sufficient condition by passing air to other partition expansion sections. The seal for bending can also be formed in the shape of intermittence (the shape of a broken line), although you may form as one continuous line. In this case, it is not necessarily required to leave the path of airstream popular use between the crossing jump-off lines of both the sides.

[0006] The seal for bending can be simply formed by forming alternatively 1 or the intermittent heat-sealing cutting edge beyond it in which horizontal migration is possible between the edges on both sides of the basic heat-sealing equipment which seals the edges on both sides of an air bag. Since the dimension of each partition expansion section can be easily changed only by adjusting spacing of this alternative heat-sealing cutting edge, it can respond easily also for change of the height (thickness) of packaging goods-ed, or a configuration promptly.

[0007] Moreover, it can bend by increasing the number of alternative heat-sealing cutting edges, and increasing the number of heat sealing for bending, and a number can be increased. Since each expansion section is classified into two pieces, two air bags are folded and it comes to be able to do, if the number of the seals for bending is one, if the number of the seals for bending is two, three will be folded and it can do, and if it is three and is a quarto and 4, five are folded and it comes to be able to do. It is useful to 3 chip-box air bag carrying out an encapsulation buffer so that the edge of for example, square goods may be wrapped. Moreover, when packaging goods-ed are five-cornered carboys, if 5 chip-box air bag of this invention is rolled one, is made into the surroundings of it and air is blown once, it sticks well all over a goods perimeter, and a husk can be carried out and a protective action can be achieved. In this way, according to this invention, the bendable expansion air bag which can easily for the configuration of packaging goods-ed, a dimension or the dimension of the clearance between goods, or a configuration certainly respond is realized.

[0008]

[Example] The example of this invention is explained with reference to a drawing. Although the example of illustration is shown as an air bag concerning this invention in which 3 chip boxes are possible, this is instantiation and is not limitation. Fundamentally, the air bag of this invention inserts in the self-** type entrainment tube 10 along with the one side edge among the films 1 and 2 of two front flesh sides, and edges on both sides are suitably formed as sealing side edges 3 and 4 with heat sealing. Between the sealing side edges 3 and 4 of both sides is crossed, many crossing jump-off lines 5 and 6 are formed with heat sealing as a pair, thereby, a large number continuation is carried out and each expansion section 7 is formed so that it may accept from drawing 1 . It is the part into which air does not go between the close jump-off lines 6 and 5, and it can separate the contiguity expansion sections 7 and 7 here. The self-** type entrainment tube 10 has shown in drawing the type which has two or more side-by-side installation way concerning said Japanese Patent Application No. 2-410577, although it is pressed with the pneumatic pressure of expansion circles, it closes to a self-** type, the outflow of air is prevented and the thing of various types is already developed by these people, after finishing an entrainment, although it is opened for traffic at the time of an air entrainment and air is made to flow independently in the expansion section 7 of each of an air bag.

[0009] In drawing 1 , the seal for bending applied to this invention so that these may not be crossed among the jump-off lines 5 and 6 is formed in **** parallel as 2, 8-1 [i.e.,], and 8-2 at edges on both sides 3 and 4 at each expansion section 7. Thereby, each expansion section 7 is

classified into three pieces, i.e., the partition expansion section of 7-1, 7-2, and 7-3. Although not illustrated, if the number of the seals for bending is three as mentioned above, it is divided into the four partition expansion sections by the five partition expansion sections if it is four. Since the seal 8-1 for bending and 8-2 may be formed by installing the adjustable heat-sealing cutting edge in which horizontal migration to basic heat-sealing equipment is possible as mentioned above, they can fluctuate the location of the seal 8 for bending simply according to necessary by changing the location of the heat-sealing cutting edge. Thereby, the dimension of the each of the partition expansion section is changed easily.

[0010] Between the both ends of the seal 8 (representing 8-1 and 8-2 —) for bending, and the crossing jump-off lines 5 and 6, a proper clearance is left behind and the airstream path 9 between each partition expansion section is constituted. An operation of the airstream path 9 is explained about below-mentioned drawing 5.

[0011] what is in a condition completely flat before an air entrainment in practice although drawing 2 is a cutting plane sketch equivalent to the A-A line of drawing 1 — the facilities of illustration sake — ***** — it is shown like. Sealing of the self-** type entrainment tube 10 is carried out together [the one side edge] to the sealing side edge 3, and other side edges blow air into each expansion section 7. the fragmentary sectional view which drawing 3 expands and blows the part by the side of the sealing side edge 3 of drawing 2, and specifies a tube 10 — it is — here — the vertical films 1 and 2 and the entrainment tube 10 — it is already ***** — it is shown in the condition. The entrainment tube 10 of illustration has the penetration entrainment way 11 penetrated in the die-length direction in the sealing side edge 3 side, the intermittent seal 12 is formed in the opposite side, and at least one self-** type opening (non-seal section) 13 is left behind every expansion section 7 among the intermittent seals 12 and 12. Spacing is kept from the intermittent seal 12, the 2nd intermittent seal 14 is formed, and the self-** type opening 15 is formed among the intermittent seals 14 and 14. Furthermore, spacing is set, the self-** type opening 17 is formed with the 3rd intermittent seal 16, and the self-** type opening 19 which carries out opening to expansion circles with the 4th intermittent seal 18 is formed. As for the self-** type openings 13, 15, 17, and 19, forming so that a location may shift mutually is desirable in order to ensure a self-sealing action, so that it may accept from drawing 1. Among the intermittent seals 12 and 14, the partition path 20 (or dead-end path) is formed, it divides among the intermittent seals 14 and 16, and divides between a path 21 and the intermittent seals 16 and 18, and the path 22 is formed so that it may accept from drawing 3. all the expansion sections 7 of each [way / 11 / penetration entrainment] — penetrating — carrying out [of the air bag] opening to the end at least — receiving — the partition paths (dead-end path) 20, 21, and 22 — all — each expansion section 7 — as long as — it is come out and divided and does not lead to the next expansion section. This may be realized by applying beforehand the paint of non-thermal melting arrival nature, printing ink, lacquer, etc. only to the inside of the tube equivalent to the penetration entrainment way 10, in case [at which the intermittent seals 12-18 were formed] it blows in, the original-form object of a tube 10 is inserted among the front flesh-side films 1 and 2 and the crossing jump-off lines 5 and 6 are formed with heat sealing from on films 1 and 2.

[0012] Before the expansion bendable air bag of this invention blows air, the shape of a flat sheet is presented and the entrainment tube 10 is also crushed in Taira and others so that it may accept from drawing 1. If air is blown with an air compressor etc. from the opening edge of the penetration entrainment way 10, air will push the self-** type openings 13, 15, 17, and 19 of each expansion section 7 open one by one, will be blown into the expansion section 7 (the example of illustration partition expansion section 7-1) from the self-** type opening 19, and will expand this. Since the both sides are open as a path 9 even if there is a bending seal 8, air flows into the partition expansion section 7-2 and 7-3 one by one, and expands these. If it blows in in the place where the expansion section 7 swelled to the necessary limit and ** is stopped, it blows in with the pneumatic pressure P of expansion circles, and it will be pressed, and the penetration entrainment way 11 will be crushed by all the self-** type openings 19, 17, 15, and 13 and the partition paths 22 and 21, and 20 lists, and a tube 10 will become flat at them, and will be closed so that it may mention later about drawing 5. It carries out like this, and it carries out,

and the expansion section 7 maintains expansion and achieves the role of a buffer or a package.
[0013] The air bag of this invention is freely bendable in the place of the bending seal 8 (8-1 - 8-n), also after expanding so that I may be understood from the above.

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TECHNICAL PROBLEM

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